

R E M A R K S

Claims 1, 7, and 13 were rejected under 35 USC 102 as being anticipated by Marchetto et al, US Patent 5,914,959 (henceforth, Marchetto). Applicants respectfully traverse.

Marchetto describes a system where a base station transmits at a particular modulation schema, for example, a modulation schema that is characterized by a dense constellation of symbols. At the receiver, the received signal quality is ascertained by evaluating an error measure, N, for transmitted pilot blocks. When N is greater than a threshold value that is set for the current constellation bit rate, a message is sent to the base station to employ a less dense constellation. The different threshold values and their associated constellation bit rates are stored in a look-up table within the receiver. When a threshold corresponding to the current bit rate is exceeded, one can simply drop down to the next bit rate in the table, which provides for a higher threshold. Alternatively, the table can be perused to find the highest bit rate that with an associated threshold that is not exceeded by the error measure. In a corresponding manner, a bit rate can be increased, when the error measure ascertained for the received signal drops below the current threshold value.

The clear implication in the Marchetto reference is that the acceptable error rate is higher for a sparser constellation than for a denser constellation. However, there is no teaching of why a higher error rate is acceptable, how much higher it is for each successively less dense constellation, or how the different threshold values were chosen for the look-up table.

Thus, whereas Marchetto determines a threshold value that corresponds to the existing mode *by reference to a lookup table*, applicants' claim 1 specifies a step of determining, for each mode, a threshold that is determined *by "using a retransmission model."* As indicated above, there is no teaching or suggestion of how the thresholds of Marchetto are initially selected, and there is no hint that they are selected by using a model. Certainly there is no hint that they are selected by using a retransmission model.

Therefore, it is respectfully submitted that claim 1 is neither anticipated nor rendered obvious by the Marchetto reference.

Referring to claim 7, it claims that the retransmission environment is modeled as one that includes at least one retransmission. While it is true that Marchetto describes a situation where the receiver requests a retransmission, applicants respectfully submit that such a request does not constitute a modeling of the transmission environment. It is respectfully submitted, therefore, that claim 7 is neither anticipated nor rendered obvious by Marchetto.

As for claim 13, the Examiner effectively asserts that Marchetto teaches selecting a transmission rate based on a look-up table listing, and that thus a maximum rate with acceptable error rate can be chosen. That may be so, but it is respectfully submitted that it is wholly irrelevant and immaterial to claim 13, because claim 13 specifies a method for “calculating a threshold value for each of at least one link adaptation modes in a retransmission environment” (emphasis supplied). In contradistinction, Marchetto calculates an error value (N), and compares the calculated error value to thresholds that are stored in a look-up tale, but does NOT CALCULATE any threshold values. The Examiner has not pointed to any text that shows a calculation of threshold values.

Though expected from the above remarks, applicants respectfully nevertheless note that Marchetto does not describe, or suggest, a step of “calculating a performance criteria function using at least one parameter,” as claim 13 specifies, and does not describe “determining a range of signal quality values for which the performance criteria function is maximized,” as claim 13 specifies. Even if the Examiner were to argue that perusing the look-up table is somehow equivalent to a step of determining a range, it would still not be a “determining” where “the performance criteria function is maximized.” Therefore, it is respectfully submitted that claim 13 is neither anticipated nor rendered obvious by Marchetto.

Claims 2, 3, 5, 14, and 15 were rejected under 35 USC 103 as being unpatentable over Marchetto in view of Schramm et al, US Patent 6,208,663 (henceforth, Schramm). Applicants respectfully traverse.

Referring to claim 2, it relates to the step of determining threshold values based on a model that considers the effects of retransmissions (one or more), specified in claim 1 (the first clause). In particular, claim 2 specifies that this step of determining includes a step of determining a parameter that is a function of a “radio interference rate” and “block error rate.”

As indicated above, Marchetto does not determine any threshold values, and to the extent that the Examiner considers that in the course of comparing a computed error signal to threshold values found in a look-up table there is a “determining” of threshold values, it certainly is NOT a determining of threshold values based on any model. There is absolutely nothing in Marchetto that develops any parameter (“throughput function” in claim 2) that is a function of “radio interference rate,” or “block error rate,” and certainly not as a function of both “radio interference rate” and “block error rate.”

As for the Schramm reference, it teaches a *forward error correction* approach that is based on

an evaluation of the current system and/or channel characteristics including C/I or C/N estimates, information relating to the relative location of the mobile station 12 within the cell (if available), bit error rate (BER), received signal strength, current system loading, etc.

Stated in other words, what Schramm teaches is that if one is faced with one set of conditions, one ought to use one kind of forward error correction, and if one is faced with another set of conditions, one ought to use another kind of forward error correction. Applicants respectfully submit that such teaching does not suggest that the Marchetto system, where the kind of symbol constellation to be used¹ (characteristic A) is determined from a look-up table (characteristic B) that is based on an error signal developed from transmitted pilot blocks (characteristic C) **should be totally discarded** in favor of the Schramm approach. Not only is there no suggestion for such a drastic change, there is no motivation for such changing characteristic A, or characteristic B, or characteristic C. Certainly, there is no motivation for completely obliterating the Marchetto system by changing characteristics A, B, **and** C. As an aside, it is noted that

¹ It is noted that specifying the constellation to be used is NOT the same as forward error correction.

bit error rate is not the same as *block* error rate. Based on the above remarks, it is respectfully submitted that claim 2 is not rendered obvious by the combination of Marchetto and Schramm.

As for claim 3, neither Marchetto nor Schramm address block error rate, and they certainly do not specify that the block error rate value is a “function of a SIR variable for the retransmission environment.” As an aside, neither C/I nor C/N of Schramm is the same as the SIR of claim 3. Additionally, neither Marchetto nor Schramm describe a step of “for each link adaptation mode, determining a corresponding range of SIR values for which a corresponding throughput function has a maximum value among the throughput functions corresponding to each of the at least one link adaptation modes.”

The Examiner states that Marchetto teaches that the maximum data rate can be determined by searching the look-up table. While true, that is clearly not the same as determining a range of SIR values. Therefore, it is respectfully submitted that claim 3 is not rendered obvious by the combination of Marchetto and Schramm.

As for claim 5, it specifies that “the signal quality value is one of a signal to interference ratio (SIR) and a block error rate (BLER).” Marchetto clearly has a different measure: i.e., the number of errors found in a pilot signal block.

As indicated above, there is no motivation for adopting the measures mentioned in Schramm, and in any event, Schramm does not teach, or suggest (a) using SIR (carrier to interference ratio is not the same as signal to interference ratio), (b) using block error rate (block error rate is not the same as bit error rate), and (c) using both “signal to interference ratio (SIR) **and** a block error rate (BLER)” emphasis supplied. Hence, it is respectfully submitted that claim 5 is not rendered obvious by the combination of Marchetto and Schramm.

As for claims 14 and 15, based on the above remarks regarding claim 13 and claim 5, applicants believe that claims 14 and 15 are clearly not obvious in view of the Marchetto and Schramm combination.

Claims 4, 8-12, 16 and 17 were rejected under 35 USC 103 as being unpatentable over Marchetto in view of Jacobsmeier US Patent 5,541,955. Applicants respectfully traverse.

With respect to claim 4, the Jacobsmeyer reference fails to supply that which is specified in claim 1 (from which claim 4 depends) and which is missing in Marchetto. Therefore, claim 4 is not obvious in view of the combination of Marchetto and Jacobsmeyer.

Regarding claims 8-12, claim 8 is amended herein to explicitly define the threshold below which transmission stops. The Jacobsmeyer parameters that cause transmission to stop do not correspond to the threshold specified in claim 8. Therefore, it is respectfully submitted that amended claim 8 is not obvious in view of the Marchetto and Jacobsmeyer combination of references.

As an aside, applicants respectfully disagree with the Examiner (relative to claims 9 and 10) that when communication is not reliable – in the sense employed in Jacobsmeyer – it “may be unstable and substantially zero throughput may occur at the receiver.” An unreliable communication is merely a communication that suffers from an undue numbers of errors.

Claim 16 is amended along the lines of the claim 8 amendment and, therefore, it is believed that claim 16 is not obvious in view of the Marchetto and Jacobsmeyer combination of references. Claim 17 depends on claim 16 and, therefore, the same conclusion applies.

Claim 6 is rejected under 35 USC 103 as being unpatentable over Marchetto. Applicants respectfully disagree. It is respectfully submitted that Marchetto does not describe the limitations of claim 1, and the Examiner appears to admit that the limitations expressed in claim 6 are also not described or suggested in Marchetto. Therefore, claim 6 is believed to not be obvious in light of Marchetto.

A formal set of drawings is included herein, which differs slightly from the informal drawings. Most of the changes were introduced in order to comply with border, size, clarity, and placement requirements specified in the Rules. A correction to FIG. 8 is also included to show that after transmission of data ceases, the process returns to evaluating signal quality so that, when the signal quality improves sufficiently, transmission of data can commence. A marked up copy of the sheet that contains FIG. 8 is included.

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No new matter has been introduced by submission of the formal drawings, and the Examiner is, therefore, requested to approve the drawing.

A number of new claims are added herein. Applicants believe that the added claims, like the previously considered claims, are allowable over the prior art.

In light of the above amendments and remarks, applicants respectfully submit that all of the objections and rejections have been overcome. Reconsideration and allowance are earnestly solicited.

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Respectfully,
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Marked up version showing changes made

In the claims:

8. (Amended) A method for performing wireless transmissions comprising the steps of:

- (a) measuring a signal quality value at a receiver;
- (c) determining whether the signal quality value is less than a no-transmission threshold, which threshold corresponds to lowest signal quality value that equals a diminution in signal quality due to retransmission plus signal quality assuming no retransmissions;
- (c) if the signal quality value is less than the no-transmission threshold, ceasing transmission; and
- (d) if the signal quality value exceeds the no-transmission threshold, performing link adaptation.

16. (Amended) A wireless communication system comprising:

at least one wireless receiver, wherein each of the at least one wireless receiver further includes:

- a transceiver;
- an antenna;

at least one wireless transmitter, wherein each of the at least one wireless transmitter further includes:

- a transceiver;
- an antenna;
- a processor, wherein the processor is adapted to:

- (a) determine whether a signal quality value for a current receiver is less than a no-transmission threshold, which threshold corresponds to lowest signal quality value that equals a diminution in signal quality due to retransmission plus signal quality assuming no retransmissions;
- (b) if the signal quality value is less than the no-transmission threshold, cease transmission to the current receiver; and
- (c) if the signal quality value exceeds the no-transmission threshold, perform link adaptation.

Please add the following claims: --

18. A method for performing wireless link adaptation in a retransmission environment comprising the steps of:

- (b) measuring a signal quality value at a receiver;
- (c) selecting a chosen mode by comparing said signal quality value to threshold values corresponding to different transmission modes, which threshold values result from a computation that accounts for increases in signal to interference ratio (SIR) resulting from retransmission; and
- (d) effecting said adaptation by causing transmission at said chosen mode.

19. A wireless communication system comprising:

at least one wireless receiver, wherein each of the at least one wireless receiver further includes:

- a transceiver;
- an antenna;

at least one wireless transmitter, wherein each of the at least one wireless transmitter further includes:

- a transceiver;
- an antenna;
- a processor, wherein the processor is adapted to:
 - (a) determine whether a signal quality value for a current receiver is less than a no-transmission threshold;
 - (b) if the signal quality value is less than the no-transmission threshold, cease transmission to the current receiver; and
 - (c) if the signal quality value exceeds the no-transmission threshold, perform link adaptation in accordance with an algorithm that takes into account diminution in signal to interference ratio due to retransmissions.

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